GRANT MEMORIAL BUR OAK
(Grant Memorial *Quercus macrocarpa*)
NPS Witness Tree Protection Program
National Mall
Union Square
Southeast of Ulysses S. Grant Memorial
Washington
District of Columbia

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN LANDSCAPES SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

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HALS No. DC-6

Location:	National Mall, Union Square, southeast of Ulysses S. Grant Memorial, Washington, District of Columbia
Owner/Manager:	U.S. Government, National Park Service
Present Use:	Ornamental and shade tree
Significance:	The Grant Memorial Bur Oak (*Quercus macrocarpa*) is significant because of its size, longevity, and association with the original United States Botanic Garden, as well as its preservation by Frederick Law Olmsted, Jr. during his redesign of the National Mall.
Author & Discipline:	Jonathan Pliska, Landscape Architectural Historian, 2006
Project Information:	The Witness Tree Protection Program was a pilot project undertaken by the Historic American Landscapes Survey and the National Capital Region of the National Park Service. The principals involved were Richard O'Connor, Chief, Heritage Documentation Programs; Paul D. Dolinsky, Chief, Historic American Landscapes Survey; Darwina Neal, Chief, Cultural Resources, National Capital Region; Jonathan Pliska, Historian, Historic American Landscapes Survey; Jet Lowe and James Rosenthal, Photographers, Heritage Documentation Programs.

PART I. HISTORICAL INFORMATION

Union Square is that part of the National Mall bounded by Pennsylvania Avenue, NW on the north, 1st Street, NW and SW on the east, Maryland Avenue, SW on the south, and 3rd Street, NW and SW on the west. The trapezoidal parcel lies just west of the U.S. Capitol and was included in Pierre Charles L'Enfant's 1791 design of the city of Washington. L'Enfant's plan focused on combining a rectilinear street grid with open boulevards that visually connected prominent sites and structures to be erected within the new city. Two views were of paramount importance. The first centered on Pennsylvania Ave. between the Capitol and the White House, while the second extended the axes of the buildings to the west and south. This second vista, L'Enfant's "Grand Avenue," was designed as one large, open greensward. In the twentieth century, it would emerge as the preeminent landscape within the city, the site of the National Mall. However, little was

done to realize L'Enfant's vision during the nineteenth century, as buildings and temporary structures were erected on and around the Mall, effectively destroying the original panoramic design.[1]

The first of these construction projects took place in 1820, when Congress authorized the Columbian Institute for the Promotion of Arts and Sciences to found the first United States Botanic Garden on the site currently occupied by Union Square. That same year the first greenhouses and gardens were established, and five acres of land were fenced in. The Columbian Institute dissolved in 1837, but five years later the Botanic Garden was reestablished as the home of the botanical collections gathered by the Wilkes Expedition during its 1838-42 exploration of the southern Pacific Ocean. In late 1850, the collections were moved to a specially created octagonal greenhouse, which was enlarged and expanded ca. 1870 by Architect of the Capitol Edward Clark.[2] Throughout the nineteenth century the Botanic Garden continued to grow and develop, and became well-known for its immense collection of trees and plants. Although many of the trees planted at the garden were common natives of the United States, some were rare species and others gained significance as memorial trees. Rare trees included two species of *Zelkova* (*Z. serrata and Z. carpinifolia*), ginkgo (*Ginkgo biloba*), and Japanese pagodatree (*Sophora Japonica*).[3] Most of the memorial trees honored political figures – congressmen, senators, and presidents. One of the most noteworthy of these specimens was the Crittenden Peace Oak, a bur oak (*Quercus macrocarpa*) planted ca. 1862 by Kentucky Senator John J. Crittenden, author of the Crittenden Compromise, an unsuccessful bill drafted in 1860 designed to prevent the outbreak of the Civil War by guaranteeing the permanent continuation of slavery in the extant southern states.[4] Additional memorial trees included a Chinese Oak (*Quercus serrata*) reportedly from the grave of Confucius, a lea oak (*Quercus leana*) planted by future president Rutherford B. Hayes during his term in Congress, and a silk tree (*Albizzia julibrissin*) planted in memory of President James A. Garfield.[5] Unfortunately, many of the exotic specimens have not survived to the present day, and a comparison of the historic planting plans and tree lists with extant specimens suggests that no memorial trees remain.[6]

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[1] Kay Fanning, *National Mall and Memorial Parks, Union Square: National Park Service, Cultural Landscape Inventory* (Washington, D.C.: National Park Service, National Capital Region, Cultural Landscapes Program, 2006), 14.
[2] James Goode, *Capital Losses* (Washington, D.C.: Smithsonian Institution Press, 2003), 357; U.S. Botanic Garden, "A Brief History of the U.S. Botanic Garden," in *United States Botanic Garden*, http://www.usbg.gov/history/history.cfm (accessed 11 September 2006).
[3] Frederick Law Olmsted, Jr., "Union Square Planting Plan," map drawn by Eastern Division, Branch of Plans and Design, 27 February 1935, National Park Service, Technical Information Center, folder 802, item 89046.
[4] I.N. Hoffman, "Historical Trees in the Botanic Garden," 1932, reproduced in Fanning, 97-98; Alexander M. Padro, "Wars and Remembrance: The World War II Memorial Dispute is a Case of Déjà Vu All Over Again," *Washington Post*, 13 August 2000.
[5] Hoffman.
[6] Fanning, 65.

The actions leading to the loss of these trees began in 1901, with the plan for the development of Washington, D.C., by the Senate Park Improvement Commission of the District of Columbia. Better known as the McMillan Commission, named for Chairman Sen. James McMillan of Michigan, this illustrious group consisted of Daniel H. Burnham, architect and director of the 1893 World's Columbian Exposition, landscape architect Frederick Law Olmsted, Jr., architect Charles F. McKim, and sculptor Augustus Saint-Gaudens.[7] The Commission envisioned a return to L'Enfant's "Grand Avenue," calling for an open, grassy vista leading to the Capitol, flanked by four rows of American elm trees separated lengthwise and crosswise by 50' spans.[8] The McMillan Commission's recommendations were in large part a response to the construction projects completed in and around the National Mall during the previous century. Its members scored a major victory with the 1907 demolition of the Baltimore and Potomac Railroad Station, built in 1873 at the corner of 6th and B streets, the present site of the National Gallery of Art.[9] Conversely, the Mall accommodated a bevy of temporary military structures during World War I, and as a result little was accomplished here until the 1930s.[10] However, once work began it progressed rapidly, as Depression-era work projects supplied the necessary laborers to execute the landscape designs planned more than thirty years earlier.[11]

Because it occupied the prominent position just west of the Capitol grounds, the Botanic Garden proved a severe obstacle to this "tapis-vert" (green carpet) design for the Mall. By the 1930s, the facility had fallen into a severe state of disrepair due to a lack of maintenance and funding shortfalls. Moreover, the McMillan Commission had selected its grounds as the site of Union Square, a monument to the Federal victory in the Civil War. The enormous equestrian statue of Gen. Ulysses S. Grant,[12] the centerpiece of the Union Square design, was installed in 1922, and a statue of Major General George Gordon Meade, the victor of the 1863 Battle of Gettysburg, followed in 1927. However, as National Park Service historian George J. Olszewski states, "the condition of the square was such that the two memorials were practically hidden from view, and the deteriorated structures which shared the overgrown and unkempt area detracted from the appearance of the memorials."[13] This juxtaposition lasted only a short while, as the Botanic Garden was razed in 1930 and relocated three years later to its present site south of Maryland Ave. between 1st and 3rd streets and Independence Ave.[14] Olszewski tells that work progressed rapidly on the newly created Union Square, as "the unsightly

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[7] After McMillan's death in 1902, his assistant, and the Commission's Secretary, Charles Moore succeeded him as Chairman.
[8] Charles Moore, *Daniel H. Burnham*, 2 vols. (Boston: Houghton Mifflin Co., 1921), 223.
[9] George J. Olszewski, "History of the Mall: Washington, D.C.," (Washington, D.C.: U.S. Department of the Interior, National Park Service, Eastern Service Center, Office of History and Historic Architecture: 1970), 29.
[10] Elizabeth J. Barthold, "The National Mall and Monument Grounds," (Washington, D.C.: Historic American Buildings Survey (HABS) No. DC-678, National Park Service, 1990-93), 19.
[11] Ibid., 22.
[12] Eighteenth President of the United States, 1869-77.
[13] Olszewski, 91
[14] Barthold, 21.

structures were demolished and removed; the area was given new and proper landscaping; and the memorials were restored to the importance they merited."[15]

As a member of the McMillan Commission, Congress selected Frederick Law Olmstead, Jr. to implement its redesign of the National Mall, and he therefore determined what constituted this "new and proper landscaping" of Union Square. Olszewski notes that the "Union Square of the McMillan Plan had no trees at all, creating a break between the trees of the Capital Grounds and those of the Mall."[16] There was, however, strong opposition to this clear-cutting. As early as 1908, a political cartoon appeared in the *Washington Evening Star* labeling Commission members Burnham and McKim as "tree butchers and nature butchers" who were "costumed on architectural straight lines," and "on their way with axes to make a clean sweep . . . of all the grand old trees on the Mall."[17] Olmstead undoubtedly remained well-aware of this sentiment twenty years later, and it likely influenced his decision to incorporate trees into his design for Union Square. Specifically, he directed that, "The existing fine large trees in the old Botanic Garden north and south of the requistite central open space should be preserved, and should be reinforced *[sic]*, where the mass of foliage is weak, by additional trees, obtainable in part by moving to those positions good trees which must be removed from the central open space."[18] Olmstead hoped to preserve these specimen trees while at the same time adhering to the Mall's overall processional theme, and showcasing the Grant and Meade Memorials within Union Square's central open space.

From a conservation standpoint this plan was only marginally successful, with approximately forty-one trees transplanted and 250 cut down within Union Square.[19] Many memorial and exotic trees were among those lost. Moreover, the 1971 installation of the Capitol Reflecting Pool by the architectural firm Skidmore, Owings & Merrill destroyed the majority of the remaining trees, forced the removal of the Meade Memorial, and irrevocably altered Olmstead's design. Given the severe alterations experienced by Union Square, any plantings dating back to the Botanic Garden are extremely rare; rarer still are the few trees that have remained in one location. Located several feet southeast of the Grant Memorial along 1st St., the large Grant Memorial Bur Oak ranks among the most prolific trees dating from the Botanic Garden plantings, and also remains in its original location. A 1917 landscape plan identifies this bur oak and four additional oaks clustered around it, and Olmstead's 1935 plan indicates that all five trees were to be retained in place. They functioned as a pre-existing frame for the Grant Memorial, where in most other locations Olmstead was forced to transplant trees from elsewhere within Union Square or install new trees to achieve this effect. This location again saved the trees in 1971, when the Capitol Reflecting Pool was installed west of the Grant Memorial. Although neither memorial trees nor exotic species, the Grant Memorial

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[15] Olszewski, 91
[16] Fanning, 27-28.
[17] Berryman, "Group of Le Notre-McKim Tree Butchers and Nature-Butchers," cartoon, *Washington Evening Star*, 14 January 14, 1908, reproduced in Olszewski, fig. 10.
[18] Frederick Law Olmsted, Jr., statement of 19 April 1934, quoted in Fanning, 29.
[19] Fanning, 31.

Bur Oak and its four fellow oaks provide a rare link with both Olmstead's vision for Union Square and the site's prior use as the original home of the United States Botanical Garden.

PART II. BIOLOGICAL INFORMATION

Commonly known as bur oak,[20] *Quercus macrocarpa* is one of approximately 450 diverse species classified under genus *Quercus* within the oak family Fagaceae.[21] Although bur oak bears a resemblance to white oak and several other closely related species, its distinct bark, leaves, and acorns allow for successful identification. Most oaks exhibit dark gray to gray-brown bark that is ridged or furrowed, but the twigs and stems of bur oak demonstrate this characteristic in the extreme. he bark is often deeply fissured and rough, appearing almost weatherworn. Combined with the broad, irregular habit common amongst open-grown trees, the bark helps produce a gnarled and often crooked overall appearance. The deciduous leaves contain five to seven irregularly shaped lobes and appear in the familiar oblong-ovate "oak shape" best exemplified by white oak, *Quercus alba*. However, bur oak produces the largest of all oak leaves, measuring 6" to 12" long x 3" to 6" wide at the upper half. Each leaf also features two unusually deep, wide bays (sinuses) that dip in near the middle of the leaf toward the stout, pale central vein (midrib)."[22] The leaves exhibit pinnate venation, where lateral veins diverge on either side of this large central vein. Arranged alternately on branches, they cluster near the ends, and display a dark, vibrant green color in the summer before turning a dull yellow in the fall.

Leaves and blossoms simultaneously emerge in May or June. Bur oak flowers take the form of catkins, compact and often droopy forms common among oaks but quite different from the open petal types produced by many other plants. The species is monoecious; both male and female catkins bloom on each tree. Male (staminate) catkins are yellow-green, slender, and measure 4" to 6" in length. The reddish, female (pistillate) catkins are smaller and appear as spikes on short stalks. Following fertilization, the pistillate flowers develop by autumn of the first year into short-stalked acorns, measuring ¾" to 2" long, more than half of this length surrounded by a cup. The cup's conspicuous fringe, or awns, suggests the common names bur oak and mossycup oak, and greatly aids in species identification.[23] Trees as old as 400 years still bear seeds, far older than any other oak species, with the minimum seed-bearing age approximately thirty-five years and the optimum between seventy-five and 150 years.[24]

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[20] Bur oak is also known as blue oak, mossycup oak, and mossy-overcup oak

[21] Liberty Hyde Bailey and Ethyl Hyde Bailey, "*Quercus*," in *Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada*, revised and expanded by the staff of the Liberty Hyde Bailey Hortorium, Cornell University (New York: Macmillan Publishing Co., Inc., 1976), 933.

[22] G. H. Collingwood and Warren D. Brush, *Knowing Your Trees*, ed. Devereux Butcher (Washington, D.C.: The American Forestry Association, 1964), 214.

[23] Collingwood and Brush, 215.

[24] Paul S. Johnson, "Bur Oak," in *Silvics of North America: 2. Hardwoods. Agricultural Handbook 654*, online ed., tech. coords. Russell M. Burns and Barbara H. Honkala (Washington, D.C.: U.S. Dept of

Quercus macrocarpa is therefore an extremely long-lived species.Individual trees may reach ages approaching 1000 years, and are not considered mature before 200 to 300 years of age.[25] The exact age of the Grant Memorial Bur Oak is unknown. However, several aerial photographs taken of the Grant Memorial at the time of its dedication in April 1922 show that the tree was already large and well-developed at this time, and Olmstead's 1935 landscape plan lists the trunk's diameter at breast height at 30", a circumference of approximately 94".[26] As of 2 November 2006, the Grant Memorial Bur Oak measured 125' tall, with an 85' crown spread, and a trunk circumference of 165",[27] making it the largest tree of its species known to exist in Washington, D.C.[28]

Bur oak is extremely versatile and adapts well to a wide variety of environmental conditions. The trees grow in a range of habitats – from rocky bluffs to prairies and savannahs to deciduous forest – and accept most soil types – ranging from sandy to clay, highly acidic to slightly alkaline, and wet to dry. Highly tolerant of air pollution and compacted soil, they are commonly planted as shade trees in many urban areas across the United States. he trees are particularly well suited to large lawns and other open areas such as golf courses, parks, and fields. They may also be planted along streets or closer to structures, although some pruning may be necessary and the strong roots pose a moderate damage potential to pavement, piping, foundations, and similar construction. Additionally, the presence of a deep tap root system allows *Quercus macrocarpa* to resist the damaging effects of drought by penetrating down to lowered water tables during dry conditions. This ability makes the species useful in the rehabilitation of degraded sites, as well as plantings in shelterbelts and windbreaks. The thick, gnarled bark provides a considerable degree of physical protection and often allows older trees to survive fires.

Agriculture, U.S. Forest Service, 1990), 1331, http://www.na.fs.fed.us/spfo/pubs/silvics_manual/volume_2/silvics_v2.pdf (accessed 13 June 2006).

[25] Collingwood and Brush, 215; Guy Nelson, "Plant Fact Sheet: Bur Oak, *Quercus macrocarpa*," in *PLANTS Database* (Washington, D.C.: U.S. Dept. of Agriculture, Natural Resources Conservation Service, National Plant Data Center, 5 February 2002), http://plants.nrcs.usda.gov/plantguide/pdf/cs_quma2.pdf (accessed 23 June 2006).

[26] Frederick Law Olmsted, Jr., "Union Square Planting Plan;" "Grant Memorial April 1922" and "Grant Memorial AN961," aerial photographs on file at the Museum Resource Center, National Capital Region.

[27] Measurements were conducted by the Casey Trees Endowment Fund. See Casey Trees Endowment Fund, "Largest Trees by Selected Species in Washington D.C.," *Casey Trees Endowment Fund* (Washington, D.C.: Casey Trees Endowment Fund, 2 November 2006), http://www.caseytrees.org/pdfs/BigTrees.pdf (accessed 13 November 2006).

[28] Overall tree size is calculated based on total tree points according to the following equation developed by the nonprofit conservation organization American Forests, which maintains the National Register of Big Trees: Tree points = circumference (inches) + tree height (feet) + ¼ crown spread (feet). The Grant memorial Bur Oak received 301 tree points, making it the largest tree of its species in Washington, D.C. For more information on tree measurement, see American Forests, "National Register of Big Trees," *American Forests* (Washington, D.C.: American Forests, 2006), http://www.americanforests.org/resources/bigtrees (accessed 7 September 2006).

Few insects or disease seriously threaten bur oak, although the oak lacebug may heavily defoliate trees and oak wilt often infects and occasionally kills entire groves.[29]

The Grant Memorial Bur Oak is in excellent overall condition and shows no signs of weakness, deterioration, structural unsoundness, or other indications of failing health. This favorable assessment is most likely the result of the species' natural hardiness, the care afforded it by NPS staff, and its relatively young age.

[29] Nelson; Jeffery L. Reimer and Walter Mark, *SelecTree: A Tree Selection Guide* (San Luis Obispo, Calif.: Urban Forest Ecosystems Institute, 2004), California Polytechnic State University, http://selectree.calpoly.edu (accessed 21 June 2006).